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DECEMBER, 1915.

Editorial.

PRINCIPAL JAMES McCALL, F.R.C.V.S.

By "AN OLD STUDENT."

By the death of Principal McCall a great man has passed out of the ranks of the profession. He was a big man and a strong man. For fifty-two years he has guided and directed the activities of the Glasgow Veterinary College. On many individual members of the veterinary profession he has left his beneficial impress, and on the body itself his influence has been all for life and progress. As a teacher he was unsurpassed, and as a wise and kindly adviser to his pupils he was respected, honoured, and esteemed. His lectures on veterinary medicine and surgery were stamped by sound and extensive experience, were lucid and authoritative, and occasionally rendered humorous or lightsome by apt quotations from Scotland's national poet. His large city practice gave him full play for his observant and deductive faculties and he profited thereby and benefited others therefrom. As a consultant he was a model of what an adviser ought to be and his opinion given after due deliberation and consideration could always be counted on to be based on present facts and past experience and to be judicial, valuable, and entitled to respect.

When in his youth he forsook the lawyer's office for the study of veterinary science he only showed the independence of spirit which he exhibited on many occasions afterwards in regard to questions affecting his own College, city, or the policy of our body.

He was a builder and creator in his special sphere and he possessed all the patience, perseverance, diplomacy, and acumen necessary to the successful prosecution and construction of advance movements.

XUM

In 1863 the Principal got his College established. In 1865 he took a prominent part in the suppression of rinderpest, a part that was later on equalled by his attitude towards tuberculosis and glanders in the City of Glasgow. He was an agriculturist and farm owner and a well-known breeder of Clydesdale horses and Ayrshire cattle, as also a trusted judge of stock at many agricultural shows. Through his efforts and instrumentality the public veterinary health service in Glasgow was established, and since it has become a pattern in all that is good for other cities and towns. In 1909 he was successful in having the College transformed from a private to a public institution, with a duly appointed board of governors and approved by the Scotch Education Department. The Principal's life was rich in achievement; he never stood still; he moved with the times, and not infrequently he was sagacious and far-seeing enough to move in advance of them and carry with him the best public opinion.

The length of active service on the Council and in the profession of the subject of our memoir has hardly been surpassed and never perhaps equalled in its usefulness. He held an almost unique position among us in many ways. He was always a genial, well-informed gentleman who graced our ranks. He served his day and generation well, and of him it may be truly written: —

Life's race well run,
Life's work well done,
Life's victory won,
Now cometh rest.

FOOT-AND-MOUTH DISEASE AND TUBERCULOSIS.

A RECENT leaflet of the Board of Agriculture calls attention to the cause, symptoms, method of spread of foot-and-mouth disease and the importance of prompt notification in instances and suspected cases of the disease. With such a large number of our members being on active service it is likely that outbreaks will not be so quickly detected or notified as formerly, and the danger of spread of the disease is consequently all the greater. The leaflet seems to indicate that the authorities have now come to the definite conclusion that rats, fowls, birds, cats, horses, and dogs may act as carriers of the virus. It is suggested also

that human beings may also convey the disease to animals. A good deal of evidence has been collected which goes to show that a human being may convey infection through his clothes. The origin of many outbreaks appears to be wrapped in mystery, or, at any rate, not to be plain. It is questionable whether any efficient measures can ever be taken to prevent some outbreaks, but prompt notification of the disease and suspected cases of it, combined with sanitary police regulations, are beneficent and generally pretty effective. Considering the insidious nature of the disease careful watch is always necessary. A wide knowledge among the agricultural community of the chief facts in connection with the epizootic is very desirable at the present time, and when the War terminates the importance of extra vigilance is indicated, hence for these reasons the leaflet is a very valuable and opportune one indeed. The suspension of the Tuberculosis Order seems to be chiefly due to a desire by the authorities to retrench in expenditure. The Order has done good in the past by making agriculturists give a due sense of proportion to the occurrence of this disease. The accentuation of the danger and loss due to the spread of infection from animal to animal has doubtless had quite as much effect in producing a desire to suppress the malady as any consideration of the human danger factor, for "every one is as God made him and often a great deal worse." We think, too, that really the Order has indirectly done good propaganda work, for there is hardly a corner of these Isles that can now be unacquainted with the fact that there is such a disease as tuberculosis in cattle. Some further attention in the interests of prevention may be directed to the by no means rare occurrence of the malady in pigs and fowls. The cough and sore throat cases will be more critically examined, the lumpy bags more carefully discriminated, and the screw will not be so easily disposed of as heretofore. Although the Order is not now in force, and the compensation inducement to slaughter does not apply, yet we hear and have personal knowledge of a prevalent desire to eradicate the "piner" and "waster" from the cow-house. This is all as it should be, and some day, perhaps, the prominent part which the veterinary profession has taken in bringing about betterment of procedure in this case will be appreciated and recognized at its true value by the general public.

G. M.

XUM

General Articles.

SOME INTERESTING STUDIES OF THE FOWL.

By Dr. B. F. KAUPP.
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A Study of the Abdominal Yolk.

The yolk is formed in the ovary of the hen. It has its origin in a minute sphere containing a nucleus. This nucleus marks

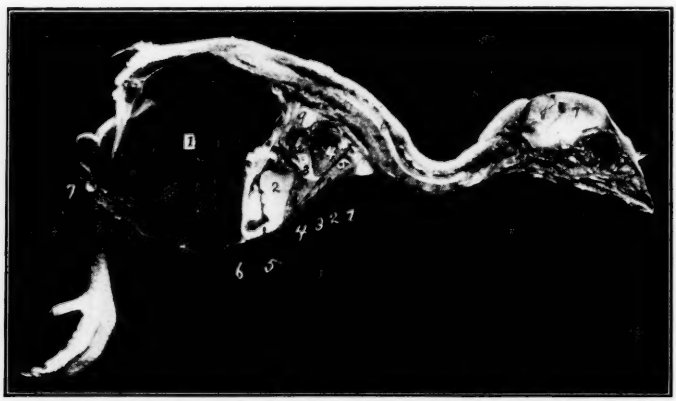

Fig. 1.—Baby chick just hatched.

Fig. 2.—Longitudinal section of baby chick.

the point of development of the embryo chick after fertilization. The nucleus in its primary state is located in the central portion of the primary ovum. When the ovum begins the development

of the yolk there is noted at first a deposit of fine granules of yolk material around the central nucleus. These granules of yolk material gradually extend toward the cell wall. The deposit is known as the latebra or the flask-shaped mass of white yolk

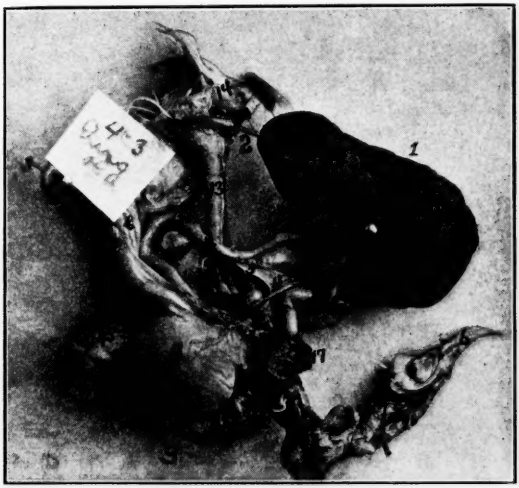

FIG. 3.—Dissected visceral organs of baby chick.

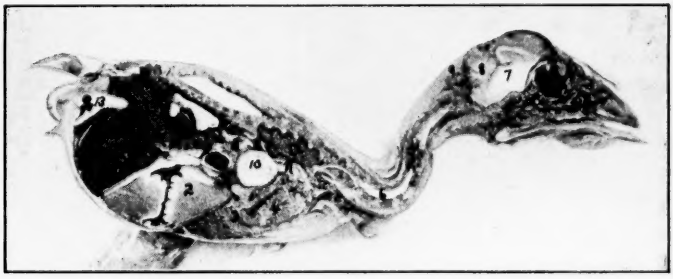

FIG. 4.—Section of baby chick.

forming thin layers upon layers of yellow yolk. Later the nucleus occupies a position at one side of the yolk and just under the vitelline membrane.

We have taken the weights of 1,454 S.C. White Leghorn eggs and have found the average weight of these to be 57·8 grm.

The yolks were carefully separated from ten eggs and the average weight was found to be 17·78 grm.

In the formation of the body of the chick the yolk is enclosed in the abdominal cavity and the vitelline membrane becomes the abdominal yolk-sac.

In a study of ten chicks that had started to pip the shell and had died it was found that the unabsorbed yolk, on an average, weighed 8·5 grm., or 47 per cent. unabsorbed. There appears

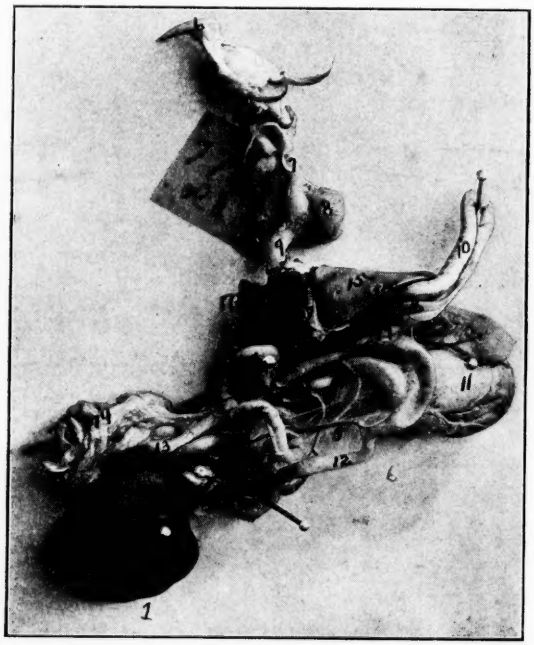

FIG. 5.—Dissected visceral organs of baby chick.

to be no absolute or definite amount of yolk left in the abdominal yolk-sac at the time of hatching. It was furthermore found that the rate of absorption of the yolk varied in different individuals even when the eggs were from the same flock and apparently of the same vigour. Thus it will be noted that in fig. No. 6 which is a photograph of a chick ninety-six hours old, there is a greater absorption of the abdominal yolk than in No. 7, which is 120 hours, or 5 days old.

In all 110 baby chicks were studied. Of these forty were killed by aid of chloroform at different ages and skinned and the carcases immediately placed in 10 per cent. formaldehyde solution. Later these carcases were sectioned longitudinally and the amount of unabsorbed abdominal yolk noted. The experimental chicks received neither feed or water.

Section No. 1 shows a baby chick just hatched; No. 1 shows the abdominal yolk-sac. It will be noted that the abdominal viscera are crowded up against the thoracic cavity. No. 2 is the gizzard, No. 3 is the liver, No. 4 is the heart, No. 5 is the sternum of breast bone, No. 6 is the spinal cord, No. 7 is the cerebrum, and No. 8 is the cerebellum.

In Section No. 2 we have a baby chick twenty-four hours old. It will be noted that some of the abdominal yolk has been

FIG. 6.—Section of baby chick.

absorbed, and that the gizzard, intestines, and liver have settled back toward their normal location. Nos. 1 to 4, inclusive, represent the same as in fig. 1, No. 5 is the intestines, Nos. 6, 7 and 8 are the same as in No. 1, and No. 9 is a small quantity of fat in the post-occipital region.

Section No. 3 represents the visceral organs removed from a baby chick forty-three hours old. No. 1 shows the abdominal yolk-sac, which weighs 5 grm. That is, in this chick in forty-three hours there was absorbed 3·5 grm. of yolk on the assumption that the yolk-sac contents originally weighed 8·5 grm. No. 2 shows the vessels from the yolk-sac to the somatic. No. 3 is the short vessel of the abdominal yolk-sac which enters the wall of the posterior portion of the small intestines. No. 4 is the long vessel of the yolk-sac which enters the mesenteric blood-vessel,

which is better shown in the dissection at seventy-seven hours old. The long vessel of the yolk-sac is much smaller in calibre than the short vessel. No. 5 is the mesentery, which unfortunately became torn before the photograph was made. No. 6 is the tongue, No. 7 the first portion of the œsophagus, No. 8 the crop, No. 9 the second portion of the œsophagus, No. 10 the duodenal loop, No. 11 the liver, No. 12 the floating portion of the small intestines, No. 13 the large intestines of rectum, No. 14 the somatic umbilicus, No. 15 the gizzard, No. 16 the pancreas, No. 17 the lungs, No. 18 the heart, No. 19 the small intestines.

Section No. 4 is a baby chick forty-eight hours old. The Nos. 1 to 9 are the same as in fig. No. 2. No. 10 is a section through the proventriculus, and No. 11 is the second portion of

FIG. 7.—Section of baby chick.

the œsophagus. No. 12 is the lung, showing it partly filling the intercostal spaces. No. 13 is the cloaca, which has partly been laid open by the incision. It will be noted that at the end of forty-eight hours there has been quite an absorption of the yolk or reserve food.

Section No. 5 is a photograph of the visceral organs removed from a baby chick seventy-seven hours old. The numbers represent the same as in fig. No. 3. The abdominal yolk-sac in this chick still contains 3 grm. of yolk. The yolk appears much paler, indicating a possibility that the absorption of the fatty portion which contains the lipochrome is much more rapid than the purely albuminous portion. However, as there was no analysis made at this time, this remains mere speculation.

Section No. 6 is a longitudinal section through the body of a

baby chick ninety-six hours old. Nos. 1 to 12 are the same as in No. 4. The abdominal organs are all in their normal positions.

Section No. 7 is a section through a baby chick 120 hours, or

FIGS. 8, 9, 10, 11, 12, 13, 14.—Transverse sections of baby chicks.

5 days old. The Nos. 1 to 8 inclusive are the same as in fig. 6. No. 9 is the proventriculus.

Section No. 8 is a transverse section through a leavel at No. 1, fig. 1. No. 1 is the spinal cord, No. 2 the apex of the lungs,

No. 3 the œsophagus. Section No. 9 is a section through fig. 1 at 2. No. 1 shows the sectioned surface of the vertebra and spinal cord, No. 2 is the lungs, No. 3 the œsophagus, and No. 4 the heart.

Section No. 9 is a transverse section through the baby chick at 3 in fig. No. 1. No. 1 is the spinal cord, No. 2 the small intestines, No. 3 the proventriculus, No. 4 the liver, and No. 5 the apex of the heart, which at this point pushes backward, occupying the anterior portion of the fissure formed by the right and left lobes of the liver.

Section No. 10 is a section through a baby chick at 4 in fig. 1. Nos. 1 to 4 inclusive are the same as in section No. 9. No. 5 is the gall-bladder.

Section No. 12 shows a transverse section through a leavel at 5, fig. 1. No. 1 is the spinal cord, No. 2 the intestines, No. 3 the gizzard, No. 4 the anterior portion of the abdominal yolk-sac, No. 5 is the femoral region, and No. 6 a section through the kidneys.

Section No. 13 is a section through the body of a baby chick at 6, fig. No. 1. No. 1 is the spinal cord, No. 2 the rectum, and No. 3 a section through the abdominal yolk.

Section No. 14 is the posterior abdominal wall. No. 1 is the anus, and No. 2 the somatic umbilicus.

SUPPURATIVE INFLAMMATION OF THE GIZZARD OF THE COCK WITH ACUTE INFLAMMATION AND BOTH ACTIVE AND PASSIVE CONGESTION OF THE LIVER WITH HÆMACIDEROSIS.

History.—The subject was a sigle-comb, Rhode Island red cock, 2 years old. This cock was used as a breeder on the Iredell Test Farm. The first symptoms noted were slight diarrhœa, mopiness, and no interest in life. He became gradually weaker, and died on July 20, 1915.

Autopsy.—The carcase was thin, there being an absence of retroperitoneal fat. There was a suppurative inflammation of the posterior half of the gizzard. The posterior portion of the gizzard cavity contained a quantity of cheesy pus (see fig. 15, No. 3). The liver weighed 60 grm., and presented a greyish appearance. The testes were in an atrophic condition.

Microscopic Examination.—A section of the gizzard, including a portion of apparently normal gizzard tissue, was prepared and

sectioned and stained with hæmatoxylon and eosin. A portion of the adjacent muscle was densely infiltrated with polymorphonuclear leucocytes as well as a zone of newly formed connective

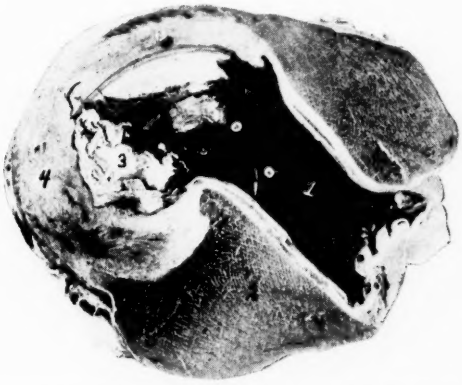

FIG. 15.—Suppurative inflammation of gizzard. 1, lumen of gizzard; 2, normal musculature of gizzard; 3, cheesy pus in lumen; 4, suppurative inflammation.

FIG. 16.—Umbilical hernia in baby chick.

tissue. There was apparently a chronic suppurative inflammation.

Sections of the liver prepared and stained with hæmatoxylon and eosin showed intense active and passive congestion with

hæmaciderosis. There was an acute inflammation, the polymorphonuclear leucocytes appearing more densely packed around the blood-vessels. In some places the inflammation appeared rather diffused, while in other parts of the liver it appeared to have a tendency to focalized areas.

Umbilical Hernia of the Chick.

We have examined many chicks in cases where they have died after partly pipping out of the shell. The shells were carefully removed and an examination, in many, showed a rupture at the somatic umbilicus or the point of the attachment on the umbilical cord. At this point the abdominal wall is very thin and is not reinforced by elastic tissue, as in quadrupeds. If the shell membrane becomes very dry and tough the straining by the chick in its efforts to free itself may prove fatal. Fig. No. 16 shows a hernia as a result of excessive straining. No. 1 is the hernial portion (the portion of the abdominal yolk-sac forced out), and No. 2 is the umbilical ring.

THE ARMY HORSE SUPPLY.

By G. MAYALL, M.R.C.V.S.

The supply of horses from Great Britain and Ireland for the country's Army has been insufficient. A greater deficit must have arisen if the numbers had not been kept up by a healthy foreign demand previous to the War, backed up by the offer of an adequate and in many cases lucrative price for the breeder. Horse-breeding can only be carried on profitably when the business pays. This is a simple, self-evident proposition which has frequently been ignored in the past, but which must be considered before advance can be made. It is the root factor in any attempt at reform in this question, and all operations having for their object the encouragement of Army horse-breeding and the furnishing of an adequate equine supply for military needs which overlook the importance of the fulness of the purse are doomed to defeat and failure. The powers that be must look at the matter in this country in a broader and more liberal spirit than they hitherto have done. A modest estimate made by the Committee of the Brood Mare Society in 1909 was that £50,000 a year was only just enough to make a beginning in setting our light horse supply in order. If the advice of knowing men had been accepted, then the position would have been better to-day. At that time France was expending £185,000, Germany £370,000, and Austria £210,000 annually in the maintenance and increase of their horse total. Drawing a line through this statement of fact it will thus be seen that the recommendation of the Brood Mare Committee hardly erred on the side of extravagance. So far about £40,000 has been the highest annual sum yet devoted to horse-breeding operations here, and lately this amount has dropped to about £30,000. If voluntary principles have to apply in horse-breeding matters the next most important factor to the patronizing and fostering of equine production is that an adequate price be given for the animals produced. It has been shown in a previous article in The Veterinary Journal (April, 1915) that a price of £40 to £45 for a four-year-old remount for the trooper is inadequate. There are many authorities who state that this assertion can be proved without a shadow of doubt and we agree with them. As payment for the right type of horse it is insufficient; as an inducement to encourage further breeding of the

type it is paltry. A move in the direction of getting over the difficulty may be made by buying three-year-olds at these prices or thereabouts and giving an enhanced value for four-year-olds. The importance of supporting breeding and making it pay becomes more and more evident every day, for the commandeering of a supply of horses already made or present as a means of satisfying the Army's needs is only a temporary measure of expediency which takes no thought of the future. The extraneous co-helpers, in keeping up the supply in the home country, are gradually dwindling owing to the advance of motorism on all sides. A source of revenue to the land is being neglected. Money that should circulate here is passing away for the benefit of strangers. We must bring renewed prosperity to the countryside by organizing and administering effective and prosperous measures of production. It is an anomaly and a reflection on us as a nation that our oldest and most vital industry is perhaps the worst organized and one of the most poorly paid in the whole category of our human activities. It is to the pastoral community and not to the business and trading classes that the authorities of the nation must look for hope in regard to future adequate horse supply and for deliverance from scarcity and scantiness. The spring is in the land and the fountain on the pastures and we need to turn our eyes towards them.

Before any business can be run properly and an estimate be given as to the likely results that can be turned out it is usual to survey the plant and take stock of the raw material present. In the case of horse-breeding the country represents the plant and the mares and stallions the stock. A great many of the most suitable parts of the country for breeding operations are already known and others may be discovered. No partiality founded on imperfect knowledge, regional preferences, or district favouritism will be advantageous. The truth is that one part of the country may be suitable for breeding cavalry horses, another place be fitted for rearing artillery horses, and a third be just the region for the production of transport quadrupeds. Again, one neighbourhood may be noted for the furnishing of hardiness and stamina, another for the granting of speed and bone, and a third for the creation of size and power. Military movements are conducted in countries with varied physical surfaces, and the horses of the plains may not do well or be at all serviceable in hilly and moun-

tainous regions. Suitable horse supply bears a close relation to the topographical features of the country to be operated in.

Have we a sufficient stock of suitable mares for our requirements? We think not. A reliable census taken by experts of the class of animal required to be the dam or sire of a given military type is needed, but this will not be furnished by employing in its compilation policemen, jobmasters, or ancient mariners. From the point of view of usefulness the last horse census was a fiasco. The reason was obvious. It did not need in its production a knowledge of hidden forces, but only a judgment as to what class a horse belonged to, and yet it was a lamentable failure. A good plea may be put in for the employment of veterinary surgeons in this connection. The Royal Commission on Horse-breeding called attention to the fact some time ago that many of the breeding districts in the country required re-stocking with brood mares. Available sources of supply must therefore be tapped and the needed material purchased. Coincidently the number of stallions needs augmenting, and this end may in part be furthered by putting a check on the exportation of these founders of essential stock. No scientific approach to the production of the best results in breeding will ever be made unless the matters of stock getting, fertility, vigour of progeny, soundness of sire and dam, and other features in connection with zootechny are understood and explored. Of what use is it to tell us that stallions, whether King's premium or not, have served so many mares unless we know how many live foals the dams have produced and how the stock has turned out. We read of laymen quoting with apparent pride that a stallion has served an average of sixty-seven or sixty-nine mares in one season, but we see no account of the number of foals accruing from his energies, and we do not forget that from forty to fifty jumps for a pure bred stallion is considered sufficient in France, where they take more exact note of zootechnical matters than we do here and have more controlled fields of observation to collect reliable statistics. Running over the number of mares to stallions in studs in Germany we get about the same figure as in France. Over use is not desirable but prejudicial, and useless use is a profitless operation leading to decay and sterility.

In connection with research into breeding matters we note that in 1912 an offer was made by Captain Part to furnish £10,000 for the improvement of light horse breeding. An experiment in

Mendelism was recommended by the authorities. We think the money might have been put to better use. We have never heard yet how the Mendelian experiments helped the science of horse-breeding in this country or what really valuable information was derived from them either economically, intrinsically, or zootechnically.

Reverting to our plant and stock simile, the next step in the conduct of a successful business is to have a good supply of, and a lucrative demand for the produced horses. The demand must be kept constant and steady and the supply reliable and sufficient. These essentials can be achieved by scientific knowledge, good organization, and sound finance.

The men who buy and the men who sell must do business together and do it directly to obtain the best results. Breeders should have the opportunity of showing their horses to the Army buyers at convenient centres.

Vested interests unless they are pliable and helpful only hinder the wheels of progress, and the whole question of horse-breeding needs looking at solely from the point of view of producing an adequate and efficient supply of military horses. Horse-breeding must be better organized in order to get better results. We can show quite as good a record in organization in some directions as the Germans, and we do it with a better spirit. In agricultural matters, however, buying and selling have never been done on a true and wide co-operative basis, and whilst many other industries have been highly organized and benefited proportionately agriculture, and horse-breeding, which is an important branch in connection with it, have only been conducted on primitive principles. The State can help this process of organization. It can lead and advise, and it is up to it to see that this country becomes more independent as regards horse production and achieves therein a sounder place in peace and a safer place in war.

A Committee has recently been appointed by the Earl of Selborne to go into the question of the light horse supply for military purposes. Let us hope that in any conclusions the Committee comes to and in any measures it advocates it will be supported as an essential and vital factor in the success of its contemplated procedure by the well-filled purse, which means a liberal and sufficient sum of money from the Treasury.

MILK FEVER IN COWS.

By PATRICK MacCORMACK, M.R.C.V.S.

Under the above heading I have just read the short article by Mr. G. Mayall in The Veterinary Journal with great interest. Perhaps his was an exceptionally tedious case, as it appears to have taken up a considerable amount of his time, and necessitated the administration of a number of costly drugs. I have a very great number of these cases annually, and so far have lost very, very few. For the benefit of those whom it may interest I have pleasure in stating the measures I adopt, and which have met with unqualified success.

On being called to the case the usual history is given to me, *i.e.*, cow in good condition (not necessarily), second or third calf (though I have had typical cases in old cows). Calved and cleaned all right, but for some unaccountable reason went down within twenty-four hours of the act of parturition. Rumination has ceased, probably also milk secretion. The head is poked straight forward, or else is held round against the side. More often than not a heavy moan accompanies those symptoms. A dull semi-comatose condition may also appear, or if the animal has been bad long very violent symptoms may be present. Urination and defecation seem to have ceased.

I immediately procure two bags packed well with hay, get the cow put up as straight as possible on her brisket, and place one of the bags under her shoulder and the other under the side and hip on the side on which she is lying, giving orders at the same time, should the beast go over to the other side the bags were to be changed also and placed as before. I think this keeping of the animal up on its breast for a few hours very essential to successful treatment.

Whether the semi-comatose condition has appeared, or otherwise, I immediately give hypodermically one of Parke Davis's "cardiac tonics." Should the violent stage be apparent, I give chloral hydras, pot. brom. āā ʒi in a quart of new milk. I then set about passing a catheter to draw off the urine, back-rake the rectum, and finally, after having previously drawn off any milk that may have been in the udder, inject sterilized air till each quarter appears well filled to the eye, and by tapping with the finger. Having tied the teats with fairly wide tape and

given instructions not to remove them for four hours, I impress upon my client the necessity of keeping the cow in the upright position for that period if necessary.

As a general rule, by the time this much is done the animal presents a much livelier appearance. I refrain from prophesying what time the animal will get up, but find from experience, and on subsequent inquiry, they usually do so in about four hours.

Should I note a tendency to dryness or hardness of fæces on back-raking, I give a pound of Epsom salts in two pounds of treacle to which some warm water has been added to thin it. This accompanied by a few quarts of warm water enemata has the desired effect of either curing or stalling off dry murrain.

[The importance of keeping a cow on her brisket is recognized by all cattle practitioners. It is one of those things we learn as pupils. The objection to the air treatment is that any layman can adopt it. The point *re* costly drugs used by Mr. Mayall in his treatment has not much force when we find Mr. MacCormack using such drugs as pure digitalin, sparteine sulphate, and strychnine nitrate (Parke Davis's cardiacs), besides, chloral hydrate is now 17s. a lb., and pot. brom. 18s. Mr. MacCormack, too, is apparently greatly favoured if all his cases of milk fever are simple, uncomplicated ones. Salts are often administered by the owners some time before a veterinary surgeon is called in. The reason for keeping the tapes on the teats for four hours is not apparent. Why not twelve? In the majority of our cases milk secretion does not appear to have ceased, because the bag is stripped each time it is injected.—Ed.]

PARASITES AND THEIR POISONS.

By F. G. MAHON, M.R.C.V.S.
Southampton

For many years the study of helminthology has been one to conjure with, so as an old student of the same, although I was first introduced to the same study whilst acting as monitor to the late Dr. T. S. Cobbold, for many years Great Britain's foremost author, writer, and teacher of the same—yes, even as far remote as 1883—and wherever and whenever opportunity in practice has occurred the subject of parasitism has been one of

extreme fascination. In having the sole charge of a large veterinary practice during the present war, *i.e.*, filling the gap for one called, and worthily so, to the honoured Army Veterinary Corps, may I be permitted to engage my readers for a few moments in endeavouring to express a few of many views on the subject. To do so is to find myself in agreement without any cavil with the extract which I give, culled from *Knowledge*, October, 1915, recording the following from that able writer and authority on zoology, &c., viz., Professor J. Arthur Thomson, M.A., LL.D.

"*Parasites and their Poisons.*—We have referred to the fact that a vigorous animal may harbour numerous parasites without seeming to be the bit the worse. But a delicate or enfeebled animal may be killed by them, and lack of vigour, or something unwholesome in the diet, may lead to an increase in the number of parasites. It has been known that 'intestinal worms' sometimes cause nervous troubles."

This was formerly attributed to the irritation of the nerve endings on the wall of the intestine, but it is now referred to the toxins which the parasites produce. Extracts of flat-worms may serve to bring on the nervous troubles if injected into the subject.

In working with these Dr. Demettre E. Paullian found that his fingers, nose, and eyes were affected. This indicates that they are volatile, and that the poisons can pass through the skin.

Reviewing these facts one cannot but express grave doubts as to the utility or rational treatment so called, hitherto in vogue. The old-fashioned, much-vaunted specifics which each practitioner hugs and cherishes in the fond belief that in its secrecy, because the majority I have encountered think, as a rule, their treatment only, and theirs only to be the best.

I have employed practically nearly every known drug of the East and Western Hemispheres, at times have tried the remedies of scores of practitioners, but as regards the efficacy of both the allopathic and homœopathic drug employment, have for years been sceptical of their efficacy, and feel sure, in many cases, the host has been materially injured constitutionally by their employment if continued over a long period.

Recently I have come across many cases of Tænidæ and Ascaridæ in the horse, dog and cat, and strange to relate, I have discarded all known anthelmintics or agents which expel worms,

so-called, and adopted antiseptic treatment, first of all building up my patients by good nourishing food, exercise in moderation, and in the horse, as a beast of burden, conserving his powers by advising less hard work than formerly and more creature comforts. This *régime* of diet, rest, and work has been followed by excellent results from a mixture of beta-naphthol and salol. Carbolic acid and glycerine has also been tried with excellent results, as has also formidine. Now all these agents are antiseptic, and if placed in a media of glycerine apparently move in the right direction, and so far as I have been, in a busy practice, able to record, my patients have in all cases done well. Surely, in view of Professor Thomson's record of Dr. Demettre E. Paullian's researches, a move in a more practical sensible light is indeed needed.

Progress in many directions of veterinary science does not seem, to my way of thinking, to have made strides in many directions since 1885, and to read the literature or records of the agents used by veterinarians in the treatment of parasitic diseases seems to be one at variance with the savants quoted and to be inimical or destructive to animal life in many cases. My intention is to pursue tonic treatment primarily; secondly, antiseptic treatment in the future, and hope at some future date to tabulate, so far as my humble abilities and pen will allow, cases treated by these means.

May I ask my readers not to be over-critical when perusing these few lines on a most worthy subject, viz., helminthology, so interesting and material both to the human and veterinary practitioner, also as regards our food supply and the dangers to the host very often when infested by these creatures (parasites), whose *rôle* in Nature is no doubt a great and useful one, otherwise we should not have such among us so often, or in such numbers, and evidently part and parcel of the Supreme Mind who fashioned them, as well as ourselves, for good or evil purposes.

SOME IMPORTANT CATTLE DISEASES IN NORTH-WEST RHODESIA NOT MENTIONED IN THE TEXT-BOOKS.

By J. MALCOLM ARMFIELD.
G.V.O., Lusaka, N. Rhodesia.

I was interested in reading Mr. W. Kennedy's account of three-days' sickness in East Africa, appearing in the March edition of this Journal.

Last rainy season (from November, 1914, to March, 1915) I had the opportunity of observing a large number of cases of this disease and found the symptoms similar to those in the above-mentioned article. But I also observed on many farms a sort of prolonged "three-days' sickness" which accounted in many instances for a high mortality. Instead of the usual rapid recovery, the animals remained with a stiff gait in the hind limbs for many weeks and showed emaciation. I may mention that the rains were unusually heavy last season. Another disease which has caused great havoc amongst bulls imported from England into this country is the so-called "posterior paralysis." This appears to be a new ailment, observed for the first time during the last two years in this country.

At present, although a considerable amount of work has been done on it, practically nothing definite has been discovered.

The Cause.—At first the inoculations for gall sickness and red-water carried out by the Veterinary Department were blamed by the farmers. There does not appear to be any foundation for this suspicion, as recently I have observed several typical cases in animals which were not inoculated for the diseases just mentioned. Experiments in which it was tried to infect healthy animals by transmission of blood from infected ones have failed.

Sarcosporidia.—These organisms were discovered in the muscles of the thigh of affected animals, but similar organisms were also found in old animals not suffering from "posterior paralysis." *En passant*, sarcosporidia were suspected by some high authorities to be the causal agents of a similar disease, namely, lamziekte, in the Union. But Theiler refuted the idea. No specific bacterium has been isolated.

Possible causes may be poisonous plants, change of diet, change into a semi-tropical climate. These matters have not been fully investigated up to the present.

Symptoms.—The disease may take an acute or a chronic

course. Several recoveries have occurred, but the majority of cases terminated fatally. I have seen two cases where death occurred three weeks after the onset of symptoms. The animal is first noticed to be walking lame behind and "a knuckling over" at one or both fetlocks. This lameness gradually increases and soon the subject is found down in his stall able to rise only with difficulty. He usually gets up horse fashion (the forelegs first). As time goes on he cannot rise without assistance and finally is unable to get up at all. All this time his appetite and general health remain practically normal. Urination and defæcation are performed with ease—thus it would seem that the abnormality of the nervous system occurs behind the lumbo-sacral plexus. I have found the temperatures raised 2 to 3 degrees at the beginning of an attack, while when death is approaching the temperature has been subnormal. (In a semi-tropical climate it is difficult to arrive at much information from the thermometer.) In the last stages the animal becomes emaciated and covered with bed sores.

Occurrence.—Thoroughbred bulls imported from England. Half-bred stock (home stock crossed with native stock) native cattle. Up till quite recently we considered "posterior paralysis" as only affecting imported stock, but in the last few months apparently identical cases have been observed in pure native cattle.

I have not had the opportunity of studying lamziekte, but several farmers who have seen both diseases inform me that they are unable to see any difference between lamziekte of the Union and "posterior paralysis" of Rhodesia, but Theiler declares they are two different diseases, although the causal agent has not been discovered in either case. It is as well to be optimistic, and naturally one hopes to live to see some of these mysteries cleared up, but one cannot help remembering that one of the most common diseases in cattle at home, also a paralysis, namely, milk fever, has not, after all these years, had a specific cause allotted to it.

It is worth considering if there is any connection between three-days' sickness, prolonged three-days' sickness, posterior paralysis, and lamziekte. They all seem to be cases of spinal paralysis, but the greatest similarity lies in the paucity of one's knowledge concerning them all.

FLY PREVENTION MEASURES.

By a Sanitary Officer, British Expeditionary Force.

A short account of the measures undertaken for the reduction of *Musca domestica* in manure heaps, in camps and in billets in military areas, is thought to be useful at such a time. Details are given, for attention to what appear to be minutiæ is the secret of success.

To describe the life-history of the house-fly would be imposing on one's readers, and only special points elucidating processes undertaken with a view to fly reduction will be referred to.

Manure Heaps.

Adult pregnant flies lay their eggs in clusters; the clustering is readily recognized, and occurs in fresh manure as a rule, but will also occur in stale manure freshly turned over. The clusters occur in cracks in the manure and consist of hundreds of flies, sometimes so many that on more than one occasion flies have been seen leaving a cluster (having laid eggs), carrying one or more eggs on their backs, which have been deposited there by mistake. Clustering is always to be found in a sheltered spot, preferably facing the sun and in places which have been trodden on. Where flies are seen clustering they are not disturbed, but clusters are marked with a stick, and when completed the eggs are lifted and burnt. A trained man removes thirty to forty batches of eggs in a day, which practically means dealing with the egg supply of the day. These eggs have to be removed the day of laying, as in summer time the eggs hatch out in a few hours (four to eight).

The manure brought down from stables has been exposed to flies and contains eggs and larvæ; these cannot be recovered. Passing from the egg to the larval stage, for the purposes of this paper the larval instars will be dealt with as consisting of two only: the first the feeding larvæ, the second the larvæ about to transform into the pupæ. This division is made owing to the different habits of the two stages.

The first stage is passed in the manure on which it feeds. Owing to fermentation and the heat arising therefrom it is only the upper two or three inches of manure which are suitable for feeding larvæ. A study of this stage of the insect shows that

it does not migrate to any extent; as eggs are laid in clusters so the feeding larvæ are to be found in accumulations known as nests. Where feeding larvæ exist in large numbers the manure is absolutely triturated, and search for these larvæ is facilitated by recognizing these triturated places.

During this, the feeding stage, there is no known method of trapping owing to the fact that in horse manure is the natural food supply. On completion of feeding the larva ceases to grow and then it begins its second stage. This is the true migratory life, when its object in life is to find a suitable place in which the pupal stage can be passed. Manure is no longer suitable unless it has ceased fermenting. The larval movements have been studied and are found to be carried out at night and on the surface. This is the creamy stage, so-called owing to the colour, the larva having voided the contents of its intestinal tract. Food no longer being necessary the larvæ are seen on the surface of manure, making, apparently by instinct, for a suitable site. This must be such as to retain sufficient moisture to keep the pupæ from being desiccated, and it must be comparatively cool. Such a site is to be found in the earth on which the mound is placed, or in any hay or straw lying on the surface and which is not fermenting, or else in the old cold portions of the manure heap. Pupæ are to be found in such places in enormous numbers. Incidentally it may here be stated that in the natural traps many pupæ are killed off by a fungus, presumably the *Empusa muscæ domesticæ*. With this knowledge Nature has been imitated and traps are placed to catch larvæ in the "creamy" stage.

The following is a description of the trap and the manner in which it is used.

Square ration tins are used; these have slits made in all four sides at a level of about 2 in. from the bottom; these slits are kept open by means of a pebble placed inside so that the upper edge overhangs the lower. The tins are then filled with about 4 in. of sand or chaff, and are then embedded in the manure so that the slits are on a level with the surface of the manure. On wet nights the tops of these tins have to be covered over. In one such trap over 5,000 larvæ have been caught in a night.

Method of Laying Traps.

It is understood that the manure is dumped at a heap. The face which is not being dumped against must be well trimmed

off and a drain channel cut along its face: the earth from this drain must be thrown away from the heap and not on to it. Traps are placed along the edges of the mound at about an interval of 3 to 4 ft. As the heap is added to the line of traps is advanced so as to keep the old manure isolated from the fresh. Where this method is taken into use on an old mound, the line at which the traps should be placed is worked out as follows: Starting from the fresh manure, this is turned over to find feeding larvæ, similarly the old manure is searched for pupæ. This portion of the heap has to be shut off from the fresh manure, so that the traps have to be put as close to the fresh manure as possible, at a point well within the places where the pupæ are to be found. By the use of these traps a heap can be kept free of creamy stage larvæ. The chaff with larvæ are burnt daily.

Dealing with the adult flies on manure heaps, formalin solution is used. The strength of this solution is 1 in 40 of the 40 per cent. solution, to which is added "ghurr," a native raw sugar ration, somewhat similar to molasses. The solution is placed on the heaps in inverted tins, with pieces of bread soaked in it. These traps work excellently on calm dry days and are not of much use in wet weather. The reason for this is due to the anatomy of the mouth-parts of the house-fly, which is such that all food has to be sucked up through a tube in the form of a solution. Water, therefore, is essential to the life of the house-fly, and the drier the surroundings the better the result from the formalin. On windy days the tins must be placed in sheltered positions at the sides of manure heaps.

On wet cold days the insect is too numbed to fly and crawls about on the surface of the manure, from which it apparently gets both its moisture and nourishment. What the food is cannot be stated, as sugars are said not to be found in horse-dung.

The supervision of the above-mentioned operations can be carried out by one man, and the following brief recapitulation gives an idea of results obtained:—

(1) *Marking clusters and removing eggs.*—Maximum number destroyed in a day forty clusters, estimated number of eggs per cluster 2,000; total, 80,000 eggs destroyed per day.

(2) *Larvæ Traps.*—Sixty traps, maximum count for one trap over 5,000, average estimate per trap 2,500; equals total 150,000 larvæ caught per day.

(3) *Formalin Traps for Flies.*—Sixty traps, a rough estimate for flies feeding off each trap 100; a total of 6,000 flies killed daily.

From the above it is seen that about 236,000 of all stages are destroyed per day; roughly put, a quarter of a million are got rid of by the exertions of one trained man. When a manure heap is dead the sides are sown with oat and hay seeds, the top being planted with marrows and flower seeds obtained as a gift from Messrs. Carter and Sons. Incineration of manure is being carried out with results at another unit.

The incinerators used are locally known as "bedsteads." Large-meshed wire netting, as used for reinforcing concrete, is placed on iron bars supported on cresol drums. Simplicity and ease in erecting are aimed at.

In the incineration of manure two main difficulties have to be surmounted, the one the removal of ash and the other the prevention of condensation of moisture; both are overcome by using this type of incinerator. The incinerators are put up on top of the manure heap, where they are exposed to the wind; they are arranged in a circle, the inner side of which has a narrow gauge tram-line, which is the means by which the manure is brought from the stables down to the dump to feed the incinerators. The bedsteads are covered with the drier portions of litter, and manure placed on top; fires are started with old sacks placed in paraffin, which are applied to the face or faces exposed to the wind, and a ridge of burning manure is thus obtained. Once the fires are started the incinerators should be loaded up to a depth of 2 to 2½ ft. The side of the incinerator away from the wind has a piece of corrugated iron put against it to cause the air current to pass up through the burning manure.

Ashes are removed from the fire by hitting the under-surface of the incinerator, they are then raked away and thrown on the side of the mound.

The condensation of moisture is avoided by not loading to a greater height than that already indicated, otherwise the upper layers of manure will be rendered sodden. Once an incinerator is burning well, it is found to burn through in different parts; these holes have to be filled in, otherwise the fire burns out. A fire once started can go on indefinitely. With this method the chief objections are the amount of labour required and the

material for bedsteads. As with other manure heaps, the number of adult flies is kept down by the 2½ per cent. formalin traps.

Methods employed in Camps and Billets.

Here the only stage which has to be dealt with is the adult fly. Breeding does not occur owing to the fact that all refuse and excreta are removed and burned daily.

Methods used generally in camps consist in attention being given to the following:—

Kitchens.—Wire gauze is applied to all windows; this is not done to doors, so that cook-houses are in nowise fly-proof. Where flies are a nuisance the use of chicks to windows and doors reduces them enormously and is much better than wire gauze, as flies object to darkness. All cook-houses and dining-rooms are furnished with balloon wire fly-traps, baited with jam or sugar in solution. The best bait is stale beer and sugar; and a bait which is now being tried is equal parts of cheese and sugar made into a paste with water.

Plates with the formalin solution are placed on brackets and each has a piece of bread placed in it.

Fly sticky papers are not issued, and a formula for making this mixture was obtained from Lieutenant R. R. Newstead, of the Entomological Commission, and is as follows:—

Five parts of castor oil and eight parts of resin, the mixture being well boiled. This is issued either spread on paper or in tins, and the units see to the spreading.

Cook-houses are sprayed out weekly with 2 oz. to the gallon formalin solution, and in those billets where flies are numerous spraying is carried out two or three times a week and sprayed at night.

For this work fly brigades have been at work, consisting of an N.C.O. and four men, and the work required of them is seen from the form which is shown.

No fly counts are made, and the expressions "Numerous" or "Not numerous" are the indications as to whether a billet requires more than the usual spraying.

The remaining places where precautions are taken are meat stores, food stores, dining-rooms, latrines, and incinerators. All these places have the formalin solution placed in them.

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Protection of foodstuffs is carried out as thoroughly as possible, but as this paper is an account of measures taken for the reduction of the house-fly, this subject will not be further referred to.

UNIT_____ FOR MONTH OF_____

ADDRESS_____ COMPILED BY_____

1	2	3	4
Date of inspection	Condition of meat-safe : scrubbed, clean, food only	State of kitchen : if clear of clothing or boxes	Position of meat-safe : in passage, out of sun
5	6	7	8
Number of plates containing formalin, and position	Number of windows and panes	Size of panes (exactly)	Wall-paper, walls, or white-washed
9	10	11	12
Refuse-bins : number and if properly covered	If refuse-bins are smeared inside of lids	If sufficient provision for covering *all* foodstuffs	If drain gully is cleaned and paraffined
13	14	15	16
Windows and doors paraffined	Number of flies in cookhouse : numerous or not	Type and state of latrines	Number of flies in latrines : numerous or not

CONCLUSIONS ON BURSATI.

By the late Lieut.-Col. J. D. E. Holmes, C.I.E., M.A., D.Sc., M.R.C.V.S.

(1) A considerable amount of confusion exists in literature regarding the identity of bursati in India with "leeches" in America, "swamp cancer" in Australia, and other affections described as "summer sore," "granular dermatitis," and "parasitic fibromata," &c.

Bursati of fetlock and pastern. Sore circular in contour, in centre dry granulations, callous edges of skin.

(2) The latter affections, such as "summer sore," "granular dermatitis," and "parasitic fibromata," &c., are held, on the observations of several authors, to be connected with the presence of nematode embryos.

(3) Bursati varies in most clinical aspects from the affections described as "summer sore," "granular dermatitis," and "parasitic fibromata," &c.

(4) There is not sufficient evidence to prove that nematode embryos are present in bursati lesions, or that the bursati sores or tumours are caused by such embryos.

(5) There is a similarity in several clinical aspects between "leeches" and bursati.

The presence of a fungus in "leeches" has been recorded by several observers and described as causal agent. The spores and mycelia of a somewhat similar fungus are frequently to be found in the kunkur and tumours of bursati.

(6) The presence of spores and mycelia in the bursati tumours, and the fact that cultures of a fungus of the genus *Sporotricum* have repeatedly been obtained from bursati tumours and kunkurs and also direct from the blood of horses infected with bursati,

Atypical form of bursati, causing a difluse erosion of the skin.

affords some evidence that the disease is a mycosis somewhat resembling the sporothricosis of the horse and mule described by Carougeau in Madagascar.

General attention to the health of patients under treatment is advisable, and although I am unaware of recorded cases of transmission of the sore from horse to horse by means of outside agencies, it is well to isolate cases and to treat each as a potential source of danger to others. Recently encouraging results are following the administration of arsenious acid to cases under treatment in doses of increasing strength and for periods up to a month.—*Memoirs of Dept. of Agric., India.*

ARGUMENTS IN FAVOUR OF THE THEORY THAT PLANTS CONTAINING OXALIC ACID ARE THE CAUSE OF HÆMATURIA IN CATTLE.

THE cause of hæmaturia has long been looked for in vain; many theories have been advanced and refuted, so that it is natural for me to be conservative in what I am about to say, and in interpreting the results of the experiments I have lately been conducting. Before going any further, I should like to mention the valuable help given to me by Dr. W. E. Dixon, the noted toxicologist of Cambridge University; he it was who helped me to formulate the ideas I now hold on the subject.

These experiments, to my mind, are very encouraging, and my field observations back them up, so that I feel much more satisfied concerning the outlook of controlling hæmaturia than I ever did before. Experiments were undertaken to prove that oxalic acid in plants played an important part in producing hæmaturia in cattle. The experiments were divided under two heads; one the injection of calcium oxalate crystals into the bladder, the other the feeding of oxalic acid by the mouth.

In experimental injections into the bladder of calcium oxalate crystals the animals evinced great irritation, and, after several injections, made on consecutive days, straining became more marked, and finally bloody urine was passed. This proves conclusively that calcium oxalate crystals can wound the walls of the bladder sufficiently to cause hæmorrhage. These experiments have been made with four different animals.

Calcium oxalate crystals have been demonstrated in many cases of hæmaturia in this country, and I found them also in a specimen I brought back with me from France. Their numbers are often small, but I have already shown that the disease takes, on an average, six years to develop; thus it is probable that the constant irritation of these crystals, even when present in small numbers, may eventually produce hæmaturia. Nearly all the experimenters who have worked on hæmaturia say that the bladder lesions are undoubtedly the result of prolonged irritation. An interesting point which I have not seen mentioned is the fact that the majority of the lesions found in the bladder are in the most dependent parts; this likewise suggests that the irritant falls to the lowest parts of the organ in the same way that calcium oxalate crystals fall to the bottom of a beaker.

The results of feeding oxalic acid by the mouth have not been as satisfactory in producing hæmaturia as the foregoing method of injecting crystals into the bladder. Oxalic acid is toxic for the first few doses, but very soon the animals develop a toleration for the drug and can take very large doses. The effects on the urine are apparent from the first. Albumin is seen, and epithelial cells become numerous after sedimentation. Red blood corpuscles also appear in smaller numbers; in some cases they are in sufficient quantities to be visible to the naked eye. Calcium oxalate crystals are numerous. Three calves and a cow were experimented on. It is a fact that, under natural conditions, young animals under 2 years of age rarely contract the disease. In my own experience I have never seen such a case, but have heard of one or two at 18 months. This age limit supports my theory, because young animals which drink milk are not affected. At first they do not take green food at all; later when they begin to do so, the lime which is in the milk would be sufficient to cause the oxalic acid in the plant to be turned into calcium oxalate and eliminate it as such in the fæces. It is possible that the hydrochloric acid which is present in the digestive juices may be strong enough to act on some of the oxalates found in the plants, converting these into oxalic acid. If this is so, the lime would neutralize this effect. No experiments have been made to prove or disprove this point.

In the experiments I have been conducting of giving oxalic acid by the mouth a large percentage of it must be eliminated in this way; but, when there is too much for the lime in the food to act on, a certain amount of the free acid must be absorbed; hence the crystals are probably formed somewhere in the urinary tract, when the acid comes in contact with the mucous or other fluids which turn it into calcium oxalate. Arguing from this point, one would expect to find that animals which are given oxalic acid would be stunted and not grow like other animals. This is undoubtedly the case; the animals one finds in the red water districts, if born and raised there, are usually undersized. Experimentally, I have proved this in the case of two young bulls.

In treating cases of hæmaturia I have found that lime salts, such as calcium chloride, calcium lactate, and ordinary lime, help animals. In several cases I have seen the blood-clotting properties raised. These drugs at one time were largely used in

cases of hæmophilia, but now are not held in much esteem. It may be that the improvement I noticed was in reality produced by the action of calcium on the oxalic acid, as it is well known that oxalic acid retards the coagulation of blood. Medical men have long known that acid fruits and vegetables are harmful to some people, and there is much literature on the subject.* I have heard of cases where the ingestion of rhubarb caused smarting and burning after urination, and occasionally red cells were found on sedimenting the urine. In cases of oxalic acid poisoning in man, hæmaturia has been seen and bleeding along the alimentary tract. During the course of my experiments I have observed the irritating nature of the crystals, and have seen blood-stained saliva coming from the mouth, and bloody fæces. These are the main facts I have learned from my experiment; in the field, my observations also lend support to them. On this very farm twenty years ago there used to be many cases of hæmaturia. The land was then newly cleared, and I am told that all the fields were very sour; it is now fourteen years since there has been a case. I could mention very many cases of this sort. Hæmaturia is undoubtedly a poor man's disease, and occurs in new districts. I have seen the disease leave a farm in two or three years, notwithstanding the fact that the descendants of the original cattle remained on it. This disappearance followed clearing operations and cultivation. On other farms, where the disease is more or less permanent, one finds that the cattle are still allowed to roam at large in the woods or in partially cleared lands; but, as soon as the owner keeps his animals under fence, cultivates his land and feeds them better, the disease vanishes.

A curious and very important fact, which is well known to the farmers of this province, is the absence of hæmaturia on the delta lands at the mouth of the Fraser river. The reason for this is obvious; the land forming this delta came from the uplands of British Columbia, which are of a totally different character; no cases of hæmaturia are to be found on the inland plateaus. I am told by horticulturists that on the delta the wood of the trees resembles that found in the interior of the country, and, certainly from an agricultural point of view, the land is of the very best. There are other river deltas that I know of where

* A very complete list of references on Oxaluria may be found in Noordenss' "Metabolism and Practical Medicine," vol. iii, pp. 1053-1054.

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one finds an odd case of hæmaturia, but in these cases the source of these rivers was in the coast belt.

One other point I desire to make is that the disease is to be found in many widely separated countries—the Pacific Islands (Case), Australia (Cleland), America, France, Belgium, &c., and in these different countries the vegetation varies tremendously. Plants containing oxalic acid, however, have a world-wide distribution, which bears out my contention that if the vegetation is the cause of hæmaturia, it is not confined to one species of plant.

Many investigators have claimed that hæmaturia was a contagious disease—Detroye, Moussu, Bowhill, and Kalkus.

During the past two years I have experimented on seventeen animals, and have tried to infect them in a variety of ways—by cohabitation, by injecting urine into the bladder, by giving it by the mouth, by the injection under the skin of blood and urine —but without success. From this and other observations in the field, which I have already recorded, I consider the matter settled. I will finish this part of my report by quoting from Moussu's excellent article on the disease. Several references are made to other workers; some of their conclusions are similar to mine, except that they do not go as far. For instance, Pinchon believed its appearance was due to changes in cultivation (clearing), which in 1830 and 1860 completely altered the general appearance of the country. Sinoir had much the same ideas; Boudeaud and Cruzel thought the disease was due to poor feeding. This idea, though quite wrong, owing to the fact that animals may starve to death without showing signs of hæmaturia, backs up my statement that as a rule the diseased animals are poor specimens of their respective breeds. I do not mean that all cases are thin, but they are generally rough animals, receiving little care and attention. In talking over the benefits derived from cultivation with Mr. Moore, superintendent of this farm, he gave me an idea which I believe is correct. He says that cultivation and reseeding meadows may not check the acidity of the soil, but that it will tend to crowd out the acid plants, and that when liming is practised it tends to encourage lime-loving plants, which also displace the acid ones.

In speaking on treatment, Moussu recommends improved farming methods, such as the cultivation of pasture fields and the application of superphosphate of lime in particular. He says that Boudeaud has seen the disease disappear when these improvements had been put into practice on farms where the disease had been in permanent possession.—*From Report of Veterinary Director-General, Canada.*

Clinical Articles.

FRACTURE OF THE INFERIOR MAXILLA.

By HENRY TAYLOR, F.R.C.V.S.
Haywards Heath, Sussex.

Case 1.—The subject was a pony 15 years old, and the fracture occurred through the animal in laying hold of the manger with his teeth getting the jaws firmly fixed open and suddenly wrenching himself free. Three teeth of one side were protruding, and the inferior maxilla split longitudinally about the symphysis and also at the neck. The teeth after some trouble were got back into their normal position and kept in place by means of first, a piece of tape, and second, a bit of copper wire wound round the whole of the incisors. Some spicules of bone were taken out of the gum later on. The pony in about five weeks made a perfect recovery, and one could not see eventually that anything had been the matter.

Case 2.—This animal was an old mare about 20 years old, and the cause in this case was a kick from a colt turned out in a field. The fracture again occurred at the symphysis and neck. Treatment was on similar lines to the other, and again a perfect recovery ensued notwithstanding the advanced age.

Remarks.—In both cases, luckily, fracture was confined to one branch of the lower jaw, so the treatment was no difficult matter. In each instance the wounds in the interdental space and at the symphysis became offensive through particles of food lodging therein.

EPITHELIOMA OF THE PENIS IN A PONY.

By J. F. D. TUTT, M.R.C.V.S., F.R.M.S.
Winchester.

THE subject was an aged pony used for occasional short journeys into town.

History.—The owner came to me on September 3 last and asked me to come and see his pony, because it had great difficulty in urinating, and its sheath was very much swollen. As

a result of this the pony was rapidly losing condition, and as he was an old favourite he desired to have it remedied if possible.

On arrival at the stable I examined the sheath and endeavoured to withdraw the penis, but was unable to do so on account of the swelling. I was, however, able to feel that the top of the penis was rough and that a growth was present. I advised operation, and this was readily acceded to.

I accordingly operated on September 7. The animal was cast and given a general anæsthetic. When well under the influence of the anæsthetic I endeavoured to withdraw the penis, but had the greatest difficulty in doing so, and eventually, when I had secured it, I found that the end of the penis was covered with cauliflower-like excrescences, and for a length of five inches was greatly enlarged and hardened.

The urethral opening was practically obliterated and it was quite impossible to insert a catheter, even when the opening was slit up for three or four inches.

The healthy portion of the penis was secured by a piece of wide tape, and the ends were held by an assistant.

The diseased portion was then carefully removed and the slit portions of the urethra were sutured to the end of the stump in such a manner as to diminish the risk of stricture. The pony made a good recovery and at the date of writing is doing well and is able to urinate quite freely. Owing, however, to the nature of the growth, I am afraid that the cure will only be a temporary one. The owner informed me that the pony did have some "warts" removed from the end of the penis some two years ago, but that for eighteen months previous to my seeing him he had never noticed him "draw" when urinating.

Microscopical Examination of Growth.

A paraffin section was cut and suitably stained. The penis was seen to be infiltrated by an extensive malignant growth having the structure of a squamous epithelioma. It was composed of ingrowing epithelial columns with cell-nests and keratinoid changes, exactly like the same growth in man.

CHLOROFORM ANÆSTHESIA: AN UNUSUAL SEQUEL.

By HENRY TAYLOR, F.R.C.V.S.
Haywards Heath, Sussex.

THE subject was a Clumber spaniel bitch, about 5 years old, which the owner had brought from British Columbia and which was being detained here in quarantine under the Board of Agriculture regulations for imported dogs. The owner told me that there had been cases of rabies in that country, but that he did not think the dog had been exposed to infection from that disease. The bitch had one of the usual kind of mammary tumours, about the size of a tangerine orange, which the owner requested me to remove, and for which the Board granted permission after some weeks' detention, and it was during the operation that the fatality happened.

The animal was placed on the operating table, but before beginning the administration of the chloroform the dog was muzzled by a piece of tape, as we did not want to run the risk of getting bitten by a dog to which even the very slightest suspicion of rabies was attached. My man acted as anæsthetist, and he is quite experienced in the administration of chloroform. The method of administering it was by means of a sleeve of thin calico into one end of which the dog's head was inserted, the orifice at the other end being adjusted to regulate the amount of air, and just inside it was placed a sponge wetted with the anæsthetic.

The dog took the chloroform rather badly and slobbered a good deal, but at length she seemed under and the operation was just being commenced when my man remarked that she seemed full of wind. The abdomen was apparently typmpanitic and the animal seemed to be labouring in her breathing, so the administration of the chloroform was discontinued, the muzzle removed, and the operation rapidly performed. On being brought into the fresh air the patient came to, but the abdomen still remained distended with gas, and there remained the laboured state of the breathing. The distension was chiefly in the flanks, but the skin was not so tense as to suggest tapping with a trocar and cannula. The animal looked haggard and frequently tried to be sick, though at each attempt nothing was ejected, absolutely nothing. Carminatives along with spiritus etheris nitrosi were administered

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at intervals with no alteration of the symptoms, and the patient died during the night.

Next morning a *post-mortem* examination was made. On cutting into the abdomen the first thing which attracted attention was the stomach, which was enormously distended with air or gas; it was so large that it resembled a football and, of course, it extended posteriorly from under the ribs to the flanks. Its walls were thin, and on pricking it collapsed in a manner which suggested that its muscular elasticity was wanting. The gas had no odour except from the medicines administered, and the organ was empty except for a few drops of liquid. The intestines had the blood-vessels of the venous system congested, but they contained no gas or air.

The cause of death was clearly due to the extreme distension of the stomach with consequent interference with respiration and the circulation of blood. It is curious that the dog did not expel the air from the organ during the frequent attempts to vomit; the explanation of that is, to my mind, the fact that the muscular fibres of the organ were in a state of atony. The advent of the air into the stomach no doubt arose from the animal swallowing it during the administration of the chloroform, and it is possible that the excessive slobbering and the muzzle together had something to do with it; at the same time I should not care to neglect any precaution to prevent getting bitten by an animal which even in the remotest degree might be affected with rabies.

Abstracts and Selections.

HOG CHOLERA.

By F. R. COMBER, B.S.A., D.V.M.
Former Assistant State Veterinarian, Wisconsin, Sault Ste. Marie, Mich.

THERE is no more vital question confronting the stock-raiser of to-day than the disease known as hog cholera. Synonyms: peste du porc (French), swine fever, pneumonia enteritis, pig typhoid, Schweinepest (German).

This is an acute febrile disease which, as far as is known, affects only hogs and which is characterized by extreme contagiousness and high death-rate. It is usual to speak of two forms of this disease, *i.e.*, the acute and chronic.

This is because of the fact that some cases of the disease is sudden in its onset and rapid in its course, whereas in others the affected hogs linger for weeks or months before death or recovery. The causative agent is the same in both, the difference being the variation in virulence of the germs and the resisting power of the hogs. Enormous losses are caused yearly in the large hog-raising states of the Middle West. Statistics verify the fact that many States lose yearly an average of over $1,000,000 from this source alone.

The cause of hog cholera is a virus, presumably a germ, according to some authors think it the bacillus cholerasuis found in the blood, urine, and other body fluids and passes through a porcelain filter sufficiently fine to withhold the minutest organisms visible through the most powerful microscope. For practical purposes it may be considered a typical germ disease.

The virus gains entrance to the body through the digestive tract or through the broken skin. Infection through the air passages seldom occurs.

The disease is transmitted by the introduction of the virus either directly by the sick hog or any agent capable of carrying contaminated substances from place to place.

Wet, poorly ventilated pens, or anything that tends to lower the vitality, renders the hog more susceptible to the infection. Young pigs are more susceptible than older ones, especially when in close quarters.

The period of incubation varies with the susceptibility of the animal, the virulence of the germ, and the manner in which the germ gains entrance to the body, and varies from a few days to three weeks.

Symptoms.—In the acute form the animals die very suddenly in a few hours or at most after a few days' sickness.

In the other form (the chronic), the disease runs a longer course.

The pigs fail to come to the trough for feed, refuse to eat, or eat earth or other indigestible substances, have chills and huddle together to keep warm, stand with back arched, hind feet close together, belly tucked in, resent being disturbed, stagger and fall; their muscles and joints are stiff and sore, are constipated, for a few days, they develop profuse diarrhœa which persists until death. Sometimes have a hacking cough and breathe fast as result of changes in lungs. They show a pus-like discharge from

eyes which often gums lids together. Rise in temperature 104° to 109° F.

The chronic form differs from the acute largely in duration of disease. There is more marked evidence of digestive disturbance, for ulcers usually form in the intestines when chronic cholera is present, sometimes in this form the hogs eat fairly well. Young hogs get stunted and emaciated and hair may drop off. Usually there is considerable reddening of the skin on the nose, ears, abdomen, inside of thighs and pubic region; the redness becomes more intense as death approaches.

Treatment.—As soon as cholera is suspected, a competent veterinary should be called to make a positive diagnosis.

Vaccinate all hogs with serum if the disease is in your locality. Disinfect and whitewash pens each week with quick lime or some germicidal agent. Feed laxative diet and pasture hogs some distance from highways and streams.

Quarantine for four weeks all hogs brought to the farm.

Post-mortem changes should be looked for as follows: Frequently the skin and underside of neck becomes dark red. The lymph glands are enlarged, congested, and of a deep red colour. The kidneys are dotted with small pin-pointed blood spots which gives them a turkey egg appearance. In some cases the lining membranes of the abdominal and lung cavities show red spots or blotches, if the disease affects lungs, the organs exhibit changes characteristic of pneumonia and pleurisy.

In chronic cholera intestinal ulcers are usually found, have a dark centre and yellow margin, and raised above the surrounding surface of the intestine. The heart and liver are normal in appearance.

The serum preparation is of such a nature that it should not be undertaken by farmers themselves, but should be under the control of trained men who have had experience in bacteriology and who are familiar with diseases of hogs. For this reason no attempt has been made to describe the details of the serum production.

It should be understood that the vaccination against hog cholera does not cure every case, for no known biological product has this power. Yet the successes obtained demonstrate that it is the only reliable agent to use. Those who are interested in the subject are urged to co-operate with the state authorities who have control of this work and to assist them in their efforts to reduce to the minimum the mortality from this much-dreaded disease. It is only through intelligent co-operation that we can expect to attain a final result which is aimed at in the eradication of hog cholera as a serious menace to the hog-raising industry of the country.—*American Veterinary Review.*

GUNSHOT WOUNDS.

By Professor L. A. MERRILLAT.
Chicago.

We shall not attempt to describe a treatment for all of the various wounds capable of being inflicted by firearms. Their varieties forbid in a short review of wound treatment, and the writer, like probably all American veterinarians, except a few in our Army who saw service in the Philippines, must plead inexperience. As the fund of information in this connection is about to be enlarged by the untold range of experience and observation of our European *confrères* it would be presumptuous for one in my position to venture into this domain at this particular moment.

In peace times veterinarians only rarely encounter wounds made by firearms, and when they are met they are generally from low-power guns or shot-guns. These, of course, inflict wounds of a different character than those of high-pressure rifles used by modern armies, saying nothing of shrapnel, shells, bombs, grenades, &c., included in their ordnance. It is the wounds of these modern arms that interest us most to-day, and as peace may not always be our good fortune it stands us in hand to acquaint ourselves with the present experiences of the able veterinarians of the European armies now in the field. Later, when we shall have the opportunity of reviewing well-arranged reports, I shall attempt to give the readers of this Journal a well-connected description of the treatment of firearm wounds compiled from the experiences of these able and experienced men.

To-day I shall content myself with a few simple recommendations. The old custom of immediately searching for a bullet imbedded in the body has long since been abandoned. It is only the plainly felt subcutaneous bullet that is removed to-day. Those lodged deeper, even though they may have been located by the Röntgen rays, are left strictly alone to become encysted or to form an abscess. In the latter event the bullet is removed when the pus of the well-matured abscess is evacuated. "Do not search for bullets unless they can be clearly felt through the skin, but leave them to the tissues, where they will either be tolerated or expelled by suppuration" (Cadeac). Thus Cadeac in a word says about all there is to be especially said about extraction of

bullets. The track of the bullet is not irrigated, nor is there any effort made to explore its depths. Local antiseptic treatment of the orifice to avert secondary infection is, however, faithfully followed, and the patient is watched continuously for febrile complication and for the abscess that will disclose the location of the bullet. Antitetanic serum is always indicated and should never be omitted in the management of firearm wounds.—*Amer. Journ. of Vet. Med.*

War Notes.

THE CAPTURE OF A GERMAN SHIP.

BY A VETERINARY OFFICER.*

THE outbreak of this War found many of us in curious places and outlandish spots, but to few of us was given the unique experience of being a passenger aboard a German ship on the day that war was declared. Such, however, was my good fortune, and the narrative may possibly be interesting to readers of THE VETERINARY JOURNAL. On August 1 the outlook was very black. Austria had declared war on Serbia, and Germany had sent an ultimatum to Russia, but it was thought by some that England would be able to keep out of the trouble. Previous to this I had made arrangements to visit British North Borneo and inspect the Government herds, and as I held, amongst other appointments, that of veterinary surgeon to the Military Forces, I had received permission to proceed on short leave for this purpose. I asked at headquarters if it was advisable to make my visit, but the answer was vague and I decided to risk it, and as events turned out I cannot say that I regret it. I lost two months of active service, but believe I was of more use to the country in the East than I could have been with the Army.

On August 3 we left Singapore on the N.D.L. ship *Sandakan*, commanded by Captain Mulliman, an officer of the

* For his prompt tact and pluck in this affair this officer has been awarded the Freedom of the City of London and a substantial portion of the prize money.

German Naval Reserve. There seemed to have been a lot of bustle at the agent's office, and I felt as though events would move swiftly within the next few days.

We were under way by 4 p.m., and at 9 or 10 p.m. the engines were stopped and we came to anchor. I asked the captain his reasons and he told me that a tug would come off at night with orders. The next morning when I awoke we were well out to sea, but stopped again at breakfast time. We then sent off a row boat to another N.D.L. ship which was proceeding to Singapore. This vessel had been given orders to proceed to a neutral port, and we continued our journey. This, of course, indicates that all the German ships' captains were aware on August 3 that Germany was going to war with Great Britain. On August 5 we put into Miri, a small station on the coast of Sarawak. It is here that the oil wells are and the tanks stand out as vivid patches of white against the jungle covering the hillside. On going ashore I met the Resident, and he seemed particularly anxious to get rid of the German ship, and I assumed that war was imminent, but did not know at that time it had actually been declared. The next night, as we were approaching Labuan, the electric light suddenly failed and the captain informed us that the dynamo was out of order, but would be working again in an hour's time. I then felt convinced that something was up and ordered the stewards to light the oil lamps in order that a distant lighthouse could see us passing. In about an hour and a half the lights were on again. I found out afterwards that the captain had an idea that H.M. survey ship *Merlin* had captured some German ships and was in Labuan Harbour; he therefore put out his lights and decided that if he saw any sign of these ships he would clear off to Sebang, in Manilla, a neutral port.

We came alongside the wharf at Labuan in the morning and commenced discharging cargo. Rice was eagerly bought by the dealers, and all stores had risen in price. It was here we heard that Great Britain and Germany were at war. The Resident informed Captain Mulliman that the ship would be detained, and the engines were dismantled. I tried hard to have the European members of the crew removed and placed under arrest, but at the moment the authorities were not anxious to take severe action. Having been amongst these people for a few

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days I knew that they were hardly the sort to sit down and do nothing. The captain was furious at having fallen so easily into our hands. Having been a student in Germany and also with the Germans in South-west Africa I understood the language and overheard a good deal that had been said, and was of opinion that plans would be discussed. I was uneasy and stood in the alleyway that night, close to the officers' cabins, and a weary vigil was well rewarded by the conversation overheard. I was convinced that something was in the wind, but had nothing definite to go on until the next morning, when I heard the chief officer say: "Well, if we have to stay here for six months we might as well let the ship stay under water as on top, and at the same time we will spoil their wharf for a year or two." I immediately consulted Commander Jenkins, of the British North Borneo Co., and asked him if he would co-operate with me, as I was convinced that they intended to scuttle the ship.

The Resident provided us with ten Sikhs and we placed all the officers under arrest. We cleared out the firemen in order that they could do no damage, and Mr. R., of the S.W.D., informed us that he found all the sea-cocks open, which meant that the ship would have sunk in a short time.

Eventually these prisoners of war were removed to Singapore, and the *Sandakan* was also brought to that port and there sold by the Prize Court.

SERGEANT-MAJOR A. J. WARBURTON.

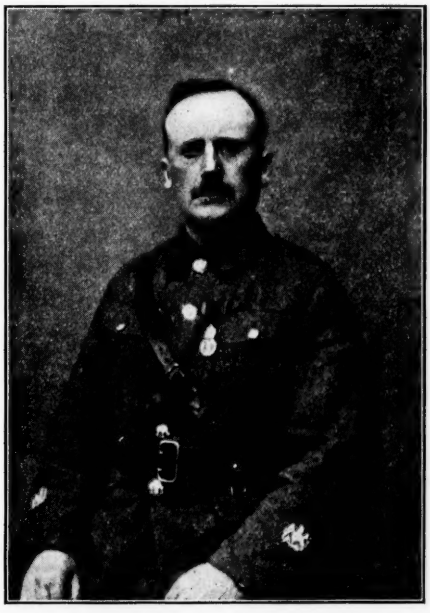
To be awarded the "Medaille Militaire" is considered a very great honour by Frenchmen, for it has on its reverse side "Valeur et Discipline," and in the French Army is only allowed to be worn by either a general or a private.

For a medal of this class to be awarded to a member of the British Army Service means great honour for the recipient and to the corps to which he belongs. The Army Veterinary Corps may well feel proud that one of its members has been selected, and the choice of Sergeant-Major Warburton is undoubtedly a popular one.

Born at Worksop in 1879, he enlisted in the 7th Dragoon Guards in 1901, and transferred three years later to the Army

Veterinary Corps, with whom he has remained ever since; previously he had seen active service during the South African War with the Sherwood Foresters. Promoted to the rank of Sergeant in 1904 whilst on service in South Africa, his rise to the rank of warrant officer took place temporarily in November, 1914, and was permanently confirmed shortly afterwards.

Amongst other appointments held whilst a staff-sergeant was that of instructor to the Royal Veterinary College of Ireland



SERGEANT-MAJOR WARBURTON, A.V.C.,
British Expeditionary Force, France.

Contingent Officers' Training Corps from May, 1911, to December, 1912, and as such his unfailing courtesy and attention to discipline will make his new honour doubly welcomed by those graduates who happened to be military students during that period. At the present time he is the Sergeant-Major of No. 5 Veterinary Hospital with the British Expeditionary Force in France, and as such is equally popular with officers and men.

Our wish is that this honour may be the precursor of many others to come.

The medal, which has a very handsome setting of laurel-wreath pattern in silver, has a gold scroll above it, and on the obverse side is the head of Liberty surrounded by the words, "République Française" in blue enamel, and on the reverse "Valeur et Discipline." The broad ribbon by which it is suspended is of golden yellow with a bright green stripe on either side.

THE LIFTING EFFECT OF A SHELL EXPLOSION.

By Sergeant HUTCHENS.

Mobile Section, Army Veterinary Corps, British Expeditionary Force, France.

In February last, whilst on mobile section duty, I was detailed for patrol work in the actual firing line, and whilst there I saw a shell hit a French transport horse full in the ribs. The animal was at the time standing in a field under a wall resting, and the force of the explosion cut the body completely in half, lifting the fore part over the wall, which was about six feet high.

A RESULT OF SHELL-FIRE.

By Sergeant GOLDSMITH.

Mobile Section, Army Veterinary Corps, British Expeditionary Force, France.

One morning in the latter part of October, after a fairly heavy night's shelling, I was sent a few fields away from our camp to collect some wounded horses.

One of the large German shells had fallen in the camping ground of a troop of cavalry and had killed eight and wounded twenty-nine others. One horse had galloped about 200 yards away before falling.

The force of the explosion had severed one horse's head completely from its body and completely lodged it into another one's side, the fractured ribs being plainly visible. There were no other wounds to be seen on either of these animals.

VETERINARY SCIENCE: NEW EDINBURGH COLLEGE.

An Appeal for Funds.

In 1823 the Edinburgh Veterinary College was founded by the late William Dick—the oldest institution of its kind in Scotland, now known as the Royal (Dick) Veterinary College—and throughout its long career it has played a great part in the development of veterinary science, having sent out some 5,000 fully qualified surgeons, who have gone to all parts of the world. In 1899 a crisis occurred in the history of the College, situated in Clyde Street, Edinburgh, but, thanks to the kind offices of some well-wishers of the institution, it was saved from extinction, and an arrangement was then made with the trustees that the management should be taken over by an independent board of representatives. Shortly afterwards the College became incorporated by Act of Parliament, and the University opened its doors to students of the College by establishing degrees in veterinary science. The old College buildings in Clyde Street were inadequate and out of date, and it was clear that improved provision for teaching was essential if the College was not to be handicapped in the development of the training of students along the lines of modern research. Following considerable negotiations, an appropriate site, extending to 1½ acres, for a new suite of buildings was decided upon at Summerhall, on the south side of the city at the east end of the Meadows. The memorial stone was laid by the Marquis of Linlithgow in July, 1914. A grant towards the site and buildings equal to about half the cost was promised, leaving the remainder to be raised by the board of the College. The total cost was originally estimated at £50,000, but owing to the increases in material and wages caused by the War the cost will now be about £68,000. The College is well advanced in construction, but to allow of entry and the work to be begun on a limited scale a sum of £12,000 is required, and an appeal is accordingly made to all interested in the advancement of veterinary teaching and practice and all lovers of animals to assist in raising this sum.

Description of the Buildings.

The front presents a substantial and dignified appearance. The main entrance leads into a hall, about which the rooms of

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the administrative department are grouped. To the right and left are arranged laboratories and classrooms, which, together with the front block enclose three sides of the quadrangle. The central part of the front block contains a hall for special academic meetings, approached by the main stair. It will give seating accommodation for 260. The fourth or east side of the quadrangle is formed by the clinical block, which has a separate entrance from Summerhall Square. The clinical block will form a model hospital for animals, being provided with operating and dressing rooms, pharmacy, and administrative offices, in addition to accommodation for all classes of animals. In connection with each department ample laboratory accommodation has been provided for research into animal diseases. The board of management have reluctantly decided that much of the projected work will require to be left in an unfinished state in the meantime, and that only such work as is essential can be proceeded with. A considerable number of rooms are being left in an incomplete state, and attention is being confined to such laboratories and classrooms as are absolutely necessary in order that teaching work may be carried on.

At no time in the history of this country has the importance of veterinary science been more apparent than it is at the present moment. In the interests of public health and to conserve the agricultural wealth of the country it is essential that a constant stream of veterinary surgeons should be furnished for civilian appointments and practice. The present War, moreover, demonstrates the urgent need for more men in the Army Veterinary Corps. The War Office has been compelled to appeal to the civilian practitioner, and the appeal has met with a response which threatens to thin the civilian ranks of the profession beyond the limits of efficiency. The output of veterinary graduates must therefore increase, or the country will suffer.

Subscriptions should be intimated or sent to the Treasurer, Mr. F. P. Milligan, W.S., 2, Albyn Place, Edinburgh, and will be duly acknowledged.

ARMY VETERINARY SERVICE.

Army Veterinary Corps.

Temporary Lieutenant R. Isherwood to be temporary Captain. J. W. Hopkin to be Lieutenant. Lieutenant H. E. Powell to be Captain. Temporary Lieutenants to be temporary Captains: H. A. Idenden, J. E. Porrett, T. A. I. Anderson, A. Burnfield, W. G. Green.

Supplementary to Regular Units or Corps,

Army Veterinary Corps.

The surname of Lieutenant D. Blyth is as now described and not as stated in *Gazette* of October 1, 1914.

Temporary Lieutenants to be temporary Captains: W. B. De Vine, J. Bradley, T. H. Tranter, J. Daunt to be temporary Quartermaster, with honorary rank of Lieutenant.

C. M. McNeill to be temporary Lieutenant, J. King to be temporary Quartermaster, with honorary rank of Lieutenant.

Temporary Lieutenants to be temporary Captains: A. F. Dykes, J. Millward, G. H. Butcher, F. R. Adams, J. Blackburn. Temporary Lieutenant J. Sherley relinquishes his commission.

J. McGregor to be Lieutenant.

To be temporary Lieutenants: J. B. Idle, A. E. Brandon, L. Barnard.

Captain P. W. Dayer-Smith to be temporary Major; the date of appointment of Lieutenant E. Child is September 27, and not as stated in *Gazette* of October 4; F. W. Somers to be Lieutenant.

E. H. Morton to be temporary Quartermaster, with honorary rank of Lieutenant.

Temporary Lieutenant S. R. Tufts to be temporary Captain.

Veterinary Major W. A. Pallin, F.R.C.V.S., from Royal Horse Guards, to be Major. Lieutenant R. T. Smith, from S.R., to be Lieutenant. Temporary Lieutenants to be temporary Captains: W. Brown, T. G. S. Bogue. Temporary Lieutenant J. W. Reynolds relinquishes his commission.

H. Tweedley to be temporary Lieutenant; Temporary Quartermaster and Hon. Lieutenant J. W. Higgins, from A.S.C., to be temporary Quartermaster; F. Cranfield to be temporary Quartermaster, with honorary rank of Lieutenant.

Reviews.

Report of the Veterinary Director-General, Department of Agriculture, Canada, for the Year ending March 31, 1914. Printed by J. de L. Pache, Ottawa. Price 15 cents.

Mr. F. Torrance, the Chief of the Veterinary Staff, is to be congratulated on the production of a very comprehensive and instructive report of veterinary activities in the Dominion. 12,430 horses were tested for glanders with mallein, and 349 reacted and were destroyed. The slaughtering method of dealing with hog cholera is still adopted in Canada, and notwithstanding its proximity to the States, where the inoculation system is largely in force and favourably looked on, the Director-General does not favour the immunizing procedure and considers that it makes the disease more widespread. 9,900 hogs were slaughtered in 1914 as being diseased or in-contacts. Diurine was prevalent in Alberta and quarantine restrictions were imposed and 459 animals were slaughtered. Rabies and sheep scab occurred in two provinces respectively, but neither outbreak was extensive.

The Report calls attention to the prevalence of tuberculosis in hogs and this coincides with the noted extent of the disease recently observed among swine, both in this country and the States.

There were few outbreaks of anthrax, but the disbursement of vaccine for black-leg was greater than in any previous year, 38,871 doses being distributed.

Mr. C. H. Higgins, D.V.S., was in charge of the Pathological and Biological Laboratory at Ottawa and has done an immense amount of valuable work.

Some interesting papers and illustrations appear in the Report and the field of research has in many cases been busily explored. Huge domains have to be guarded and controlled by veterinary activity and nothing but praise can be given to the efforts put forth by the Canadian Department of Agriculture in these directions.

The Horse in Health and Disease. A text-book pertaining to veterinary science for agricultural students. By F. B. Hadley, D.V.M., Professor of Veterinary Science in the University of Wisconsin. Illustrated. Cloth: 6s. 6d. net. Published by W. B. Saunders Co., Philadelphia and London. 1915.

This book is intended to impart knowledge of veterinary science to the agricultural student, but we think that the learner will have to be well acquainted with the elemental facts of animal structure and disease before he can study it with profit. As a primer for the agricultural student it will be above him. As a book for an uninitiated man to plunge into at once we do

not recommend it as very digestible, and to the simple person who does, acquisition of "the little knowledge which is a dangerous thing" is likely to result. It is useless putting lessons on anatomy, physiology and disease before people who have not previously had experience in the care of animals in health and sickness. We do not hold with the order and importance of the subjects in the text. We think that any volume for agricultural students ought primarily to deal with matters of hygiene, feeding, and nursing and then perhaps give first-time instruction in animal structure, organic functions, and disease. To know how to prevent colic is far more important to farmers and horse-owners than to be acquainted with the virtues of turpentine or tincture of opium, or to be able to dabble in controversy with the attendant veterinarian on matters of physiology and disease.

The book is divided into two main portions, the first part dealing with the anatomy and physiology of the horse, and the second with the common diseases of this animal. As much information as is necessary is well compressed into the various sections of the two parts. The matter is concise and the reading instructive. We do not agree with several of the author's conclusions, and certainly cannot make the two following statements square with each other: "Every horseman should be able to recognize the more common diseases," and as the more common diseases are proportionately the more largely present, why should the horseman be cleverer than the veterinarian of whom it is written: "Even an experienced diagnostician fails to make an absolutely correct diagnosis in more than 50 per cent. of his cases." We think plantar neurotomy is contra-indicated in cases of navicular disease, but the author recommends it. Blistering and firing is condemned for side-bone. We have old patients working serviceably and well on hard stones to-day that have been going for over three years after having been fired and blistered for side-bone lameness, but this is a part of the world where horses are shod with heels and toe pieces. The illustrations in the book are quite a good feature, and its binding and get-up are excellent. G. M.

A Text-book of Veterinary Pathology for Students and Practitioners. By A. T. Kinsley, M.Sc., D.V.S., Pathologist, Kansas City Veterinary College. Second edition revised and enlarged with 194 illustrations, 5 inserts, and 1 plate. Published by Alexander Eger, Chicago, 1915.

This is a well-bound and well-printed book of 390 pages on the main pathological facts and conditions which the practitioner encounters in the course of his daily avocation. It is a volume that should appeal no less to the medical man than the veterinary surgeon. At a time when workers in the field of animal pathology are not entirely limited to those who have the most experience in that direction, it may act as a corrective and guide. Whilst by no means covering the whole extent of the science of animal diseases, it is a valuable text-book for the man who wishes to

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obtain a knowledge which is essential to practitioners and students of medicine. It reminds us very much of the notes we took in lectures on pathology in days gone by, and we think that those who read, mark, learn, and digest the contents of its pages will have a good groundwork for further advance in the recognition and investigation of diseased conditions in animals and will have no difficulty in passing a professional examination on the subject. Hitherto our pathology has had to be dug for, and to a large extent has appeared to us to be second-hand; but this book puts valuable information, with which we ought to be acquainted, plainly and accessibly before us. If we have any fault to find with it, it is that it makes no authoritative pronouncement on not a few pathological conditions which we are constantly, though intermittently, knocking up against, such as braxy, Hodgkin's disease, louping ill, alopecia, scrapie, and some other plain diseases which appear to us in strange forms clinically, but which we are too obtuse to fathom or recognize.

Starting with the cell and passing on to a general consideration of disease, immunity (a particularly interesting chapter) and malformations, one phase of pathology is discussed. Circulatory disturbances, inflammation, progressive tissue changes, retrogressive tissue changes and necrosis and death, are next dealt with. Then comes a well-written chapter on the chief tumours our patients at times exhibit. Fever and infective granulomata are next dealt with, and the book concludes with one of the most useful little glossaries (in which technical terms are analysed and explained) it has ever been our lot to con. In reading through the book one statement in connection with tuberculosis attracted our attention. It is written that "2 per cent. is the estimated prevalence in the United States of tuberculosis among swine. Porcine tuberculosis is apparently on the increase." This would seem to correspond with the state of affairs in this country, where the frequency of tuberculosis in swine has recently been noted by the Board of Agriculture officials. From Canada, too, reports of the prevalence of tuberculosis in swine are to hand.

This text-book is worthy of commendation and recommendation, and inasmuch as it is concise and unique of its kind and furnishes easily accessible information on most pathological conditions, it deserves a wide circulation among all veterinarians and medical men. G. M.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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